



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/687,167	10/16/2003	Bhagya Chandra Sutradhar	PI1735USNA	6808

23906 7590 04/14/2005

E I DU PONT DE NEMOURS AND COMPANY  
LEGAL PATENT RECORDS CENTER  
BARLEY MILL PLAZA 25/1128  
4417 LANCASTER PIKE  
WILMINGTON, DE 19805

EXAMINER
----------

ZUCKER, PAUL A

ART UNIT	PAPER NUMBER
----------	--------------

1621

DATE MAILED: 04/14/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

**Application No.**

10/687,167

**Applicant(s)**SUTRADHAR, BHAGYA  
CHANDRA**Examiner**

Paul A. Zucker

**Art Unit**

1621

– The MAILING DATE of this communication appears on the cover sheet with the correspondence address –

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.138(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-3 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____.  |

## **DETAILED ACTION**

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

1. Claims 1-3 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 1 recites the limitations "(K)" and "(A)" in line 3. The meaning of the limitations "(K)" and "(A)" is undefined and therefore unclear. Claim 1 and its dependents are therefore rendered indefinite.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35

U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

2. Claims 1-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mock (US 4,254,283 03-1981).

Instantly claimed is a process for the crystallization of an adipic acid-containing oxidation product produced by the nitric acid oxidation of cyclohexanone and cyclohexanol, said oxidation product comprising adipic acid, glutaric acid and nitric acid, said process comprising, introducing into a first crystallizer said oxidation product, said crystallizer providing a first crystallization temperature sufficient to produce a first crystallizer product comprising a first mother liquor and a first harvest of solid crystals, said solid crystals being present at a concentration of at least about 10 weight percent based on the combined weight of the mother liquor and the crystals; introducing the first crystallizer product into a second crystallizer providing a second crystallizer temperature lower than said first temperature to produce a second crystallizer product comprising a second mother liquor and a second harvest of solid crystals, said second mother liquor having a lower concentration of adipic acid than said first mother liquor and said second harvest of solid crystals having a greater weight percent of adipic acid than said first harvest; and either harvesting the solid crystals from the second crystallizer if the concentration of adipic acid in solution in the second mother liquor is less than or equal to a pre-selected concentration in the range of about 2 to 12 weight percent of the weight of the second mother liquor, or, if the concentration of adipic acid in solution in the second mother liquor is higher than said pre-selected concentration in the range of about 2 to 12 weight percent of the weight of the second mother liquor, then introducing the second crystallizer product into one additional crystallizer or a plurality of additional

crystallizers in series providing successively lower crystallization temperatures until a final crystallization product comprising a final mother liquor and a final harvest of solid crystals is produced.

Mock (Column 2, lines 35-51) teaches a process for the recovery of adipic acid from the oxidation of cyclohexanone and cyclohexanol which comprises a successive series of crystallizations at decreasing temperatures. Mock (FIG.2.) teaches crystallization at 50°C (2) followed by recovery of the adipic acid crystals and crystallization at 25°C (4) and recovery of a second crop of crystals. Mock teaches (FIG.2. via line 9) recycling a portion of the second crystallizer output, mixing it with the oxidation reaction product and using it as a feed slurry. Recycling the first crystallizer output instead of the second would have been an obvious modification of the process which would have been motivated by the desire to reduce the amount of adipic acid being fed to the succinic acid recovery process. Recycling corresponds to continued successive crystallization.

The difference between the process taught by Mock and that instantly claimed is that a certain concentration range of adipic acid ( 2 to 12% by weight) in the mother liquors is maintained. Mock teaches (Column 3, lines 27-31) that the dibasic acid concentration of the initial feed solution is adjusted to 85%. Mock is otherwise silent with regard to the concentration of adipic acid at various points in the process.

Since Mock provides no guidance, however, one of ordinary skill in the art, wishing to employ the process of Mock for the production of adipic acid, would have been

Art Unit: 1621

required to determine the proper concentrations of adipic acid to employ at each stage of the process. There would have been a reasonable expectation for success since such determinations are routinely made during process optimizations.

Thus the instantly claimed process would have been obvious to one of ordinary skill in the art.

### ***Conclusion***

3. Claims 1-3 are pending. Claims 1-3 are rejected.
4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:


Soeterbroek et al (US 3,096,369 07-1963). Soeterbroek teaches a similar process using successive crystallizations at decreasing temperatures but does not teach isolation of crystal crops at intermediate crystallization stages.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Paul A. Zucker whose telephone number is 571-272-0650. The examiner can normally be reached on Monday-Friday 5:30-2:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Johann R. Richter can be reached on 571-272-0646. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1621

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



**PAULA A. ZUCKER, Ph.D.**  
**PRIMARY EXAMINER**